

## SECTION IV.—RIVERS AND FLOODS.

## RIVERS AND FLOODS, APRIL, 1915.

By ALFRED J. HENRY, Professor in charge of River and Flood Division.

[Dated: Washington, D. C., May 27, 1915.]

The only floods of consequence during the month were in the rivers of the Southwest, viz, those of Texas, including the Pecos and Rio Grande, the Red, and the Arkansas. All the floods were due to general rains over the respective watersheds.

There were two high water periods in the Red River, the first continuing from the 15th to the 18th, but the second and greatest from the 27th to the end of the month. The river passed above flood stage along the stretch from Arthur City, Tex., to Fulton, Ark. Elsewhere only freshet stages were recorded, although both the Sulphur and the Cypress, tributaries of the Red, were at and above flood stages during the closing days of the month. The Little River of Arkansas was also at flood stage on the 29th and 30th.

*Texas rivers.*—Trinity: A flood occurred in the upper reaches of this stream beginning about the 24th. At the close of the month this flood had not yet reached the Gulf.

Brazos, Colorado, and Guadalupe: Similarly, a flood in these rivers was in progress in the lower reaches at the close of the month.

During the week beginning April 18, 1915, west central Texas, particularly the counties of Travis, Williamson, Milam, and Bell were visited by a series of extraordinarily heavy local downpours of rain, attended by thunder and lightning. As a consequence the smaller creeks and streams overflowed their banks and wrecked a large number of dwellings, and thus caused a considerable loss of life. On May 3 it was estimated that 40 persons had lost their lives as a result of the floods. Twenty-one bodies were recovered at Austin, Tex., where the rainfall was 10 inches in 24 hours. The Colorado River at Austin, however, lacked half a foot of reaching the flood stage. The large loss of life in most cases occurred along the smaller streams. For additional information about floods in Texas see the article by B. Bunnemeyer below.

Rio Grande: Frequent rains in New Mexico and southwest Texas, particularly in the watershed of the Pecos River, from the 14th to the 18th, caused a moderate flood in that stream, which crested in a stage of 19.5 feet at Pecos, Tex., on the 21st. Relatively high stages were also recorded in the Rio Grande and in general the streams of eastern New Mexico, including the Canadian, were at freshet stages during the latter part of the month.

Heavy rains also affected the Arkansas in its course through Kansas, Oklahoma, and Arkansas, but the floods were not destructive in any case.

*Damages.*—In the vicinity of Carlsbad, N. Mex., the damage to canal headwork on the Carlsbad project, was approximately \$5,000 and miscellaneous losses about \$1,000. In the extreme southern part of the valley, in the vicinity of Barstow and Pecos, Tex., the damage to canals and the irrigation flume across the river is estimated at \$4,000, and to alfalfa in fields \$3,000. The prospective losses in alfalfa, cotton, and feed from water shortage due to damage to canals and flume, will probably amount to \$25,000 or \$30,000. In this vicinity

property valued at \$9,000 was saved by the warnings sent from the Denver office of the Bureau.

Hydrographs for typical points on several principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

## FLOODS IN TEXAS DURING APRIL AND MAY, 1915.

By B. BUNNEMEYER, Section Director.

[Dated Weather Bureau, Houston, Tex., May 30, 1915.]

The floods that occurred in Texas during the last decade of April, 1915, and extended well into May, while far from approaching the severity of the record-breaking floods of December, 1913, are memorable from the fact that they caused a loss of 40 lives and an indeterminable but immense damage to crops, which had to be replanted not only in the flooded area but also in sections where the soil had been washed by heavy rains. Incomplete returns give an estimated damage of \$2,354,125, exclusive of losses sustained by railroad, telegraph and telephone companies, classified as follows:

TABLE 1.—Losses by the Texas floods of April–May, 1915.

Losses in—	Watersheds.				
	Colorado.	Brazos.	Trinity.	Guadalupe.	Total.
County bridges, roads, buildings, etc.....	\$650,750	\$159,900	\$15,400	\$500	\$826,550
Crops.....	5,250	1,324,000	6,000	6,500	1,341,750
Live stock.....		68,825			68,825
Suspension of business.....		102,500	10,000	4,500	117,000
Total.....	656,000	1,655,225	31,400	11,500	2,354,125

The total damage, and especially the damage to crops, is much greater than the estimate here given on account of the small number of returns received and of the fact that in many instances no monetary value was affixed to the losses sustained.

Nearly all the deaths occurred in the creeks that were rapidly converted into raging torrents by the heavy rains and caught the people unawares. Of the 40 deaths perhaps 8 could have been prevented by the exercise of a little caution.

Considerably over one-half of the total damage reported was due to loss of crops in the field; over one-third consisted of damage to buildings, bridges, and roads, mostly in the city of Austin; and the remainder, less than one-twelfth, represents losses by suspension of business and drowning of live stock. Railroads suffered considerably from washouts and interruption to traffic.

From April 14 to 20, 1915, a series of local showers occurred over the Guadalupe, Colorado, Brazos, and Trinity watersheds, which became sufficiently cumulative to justify the issuance of advisory warnings on April 20